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Here we may give free rein to our imagination with the moral certainty that science will supply nothing tending either to prove or to disprove any of its fancies.

In this connection one is reminded of a famous apothegm,

Faith is the substance of things hoped for, the evidence of things not seen.

GEORGE C. COMSTOCK

QUOTATIONS

COOPERATIVE INDEXING OF SCIENTIFIC LITERATURE

WE have shown that the core or *umbra* of a subject is comprised in a body of homogeneous literature which unquestionably can best be dealt with by its representative professional society, but that outside this core there exists a *penumbra* of relevant matter dispersed through a literature of gradually increasing irrelevance, with the result that the recovery of the relevant matter can be effected economically only by cooperative effort. The solution, therefore, would appear to be to bring into existence a central bureau which should deal solely with the indexing of periodicals of the non-homogeneous character—and in the first stages of its work, with a restricted list of periodicals assigned to it by the contributory bodies. These bodies would receive from the central bureau entries from the periodicals examined corresponding to their specified requirements. But as the professional abstracts became more fully representative of progress in their respective fields the need for the publication of the corresponding indexes would tend to disappear. The institution, therefore, of a central bureau would ultimately make for economy in all branches of science in which the publication of abstracts is admittedly indispensable.

So far as science is concerned, it will probably be found that the simplest and most effective method for obtaining the necessary index slips would be to invite the Central Bureau of the "International Catalogue of Scientific Literature" to provide them. Indeed, the possibility of cooperation between the "International Catalogue" and the abstracting journals was one of the subjects consid-

ered at the conference held last September. Any such arrangement would probably begin with the year 1921, and, as a preliminary, the "International Catalogue" should be brought up to date by the publication of volumes for 1915-20.—*Nature*.

SPECIAL ARTICLES

THE MOTIONS OF THE PLANETS AND THE RELATIVITY THEORY

CONSTANT reference is made to the motion of Mercury about the sun and to the supposed fact that this motion can not be explained by the Newtonian law of gravitation. This current idea is far from correct: the motion of Mercury can be accounted for fully as well, if not far better, by the Newtonian law than by the Einstein law. The difficulty, which has faced mathematical astronomers for many years, is not how to account for the motion of Mercury, but how to account for that motion without introducing complications in the motions of the other planets.

In 1895 Newcomb¹ showed clearly that the motion of Mercury can be fully accounted for, under the Newtonian law, by one of several possible distributions of matter in the immediate vicinity of the sun and the inner planets. He, however, discarded each such possible explanation of the motion of Mercury because of the difficulties encountered in explaining, at the same time, the motions of the other planets. Each possible explanation of the motion of Mercury introduced a new complication somewhere else in the system.

Now identically the same difficulty is encountered by Einstein. His formulas account for the motion of Mercury, but fail to account for the motion of Mars, and introduce a further complication in the motion of Venus. The supposed explanation of the motion of Mercury by the Einstein formulas has been stressed, but the attendant difficulties in the motions of the other planets have been glossed

¹ "The elements of the four inner planets and the fundamental constants of astronomy," by Simon Newcomb.